

VULNERABILITY OF NANNING, CHINA - HANOI, NORTH VIETNAM  
AND KUN-MING, CHINA - HANOI, NORTH VIETNAM RAIL LINES AND ROADS

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GENERAL COMMENTS ON THE NANNING - HANOI RAILROAD

The 257 mile Nanning to Hanoi Railroad crosses generally undulating to moderately hilly terrain and is less susceptible to physical damage than the Kunming - Hanoi Railroad. For most of the 146 mile section from Nanning to the North Vietnam border, the line parallels at distances up to 5 miles the valley of the Li Chiang. The hilliest terrain is located near the North Vietnam border, and in this section occur the only two tunnels of the entire line. Along other sections of the line in China, the terrain consists of cultivated lowlands and river plains interspersed with low hills. Some of the hills, particularly those to the north, are limestone (karst) typically consisting of steep-sided ridge, pinnacles, caves, and sink holes. However, the karst areas apparently are not sufficiently well developed to have seriously impeded construction of the line or to create any significant problems of landslides or similar difficulties.

The 111-mile section from Hanoi to the China border crosses first a level, densely populated, and intensively cultivated plain, and then up the valley of the Song Thuong through an undulating, forested, and sparsely populated region. In this area curves increase in number and degree and gradients become more severe. The line then follows generally hilly country to the China border.

The important targets are the bridges with the most significant in China being those crossing the Ming Chiang (near Ning-ming) and the Yi Chiang at Nanning. A number of smaller bridges are also listed.

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SELECTED TARGETS - BRIDGES

CHINA

NHB- 1	Bridge 1250 feet; 12 to 13 steel spans; supported on probably concrete or masonry piers and abutments
NHB- 2	Bridge: metallic 150 feet
NHB- 3	Bridge: metallic 130 feet
NHB- 4	Bridge: metallic 300 feet
NHB- 5	Bridge: metallic 200 feet
NHB- 6	Bridge: metallic 280 feet
NHB- 7	Bridge: metallic 365 feet
NHB- 8	Bridge: metallic 290 feet
NHB- 9	Bridge: metallic 265 feet
NHB-10	Bridge: metallic 400 feet
NHB-11	Bridge: concrete 330 feet
NHB-12	Bridge: metallic 290 feet
NHB-13	Bridge; metallic 200 feet
NHB-14	Bridge: metallic 650 feet; 6 steel spans
NHB-15	Bridge: concrete 35 x 15 feet
NHB-16	Bridge: concrete 50 x 15 feet
NHB-17	Bridge: concrete 50 x 18 feet
NHB-18	Bridge: concrete 165 x 18 feet
NHB-19	Bridge: concrete 65 feet
NHB-20	Bridge: concrete 50 x 15 feet

SELECTED TARGETS - BRIDGES

NORTH VIETNAM

NHB-21 98 feet; viaduct, arch, 5 spans at 20 feet each

NHB-22 295 feet; combination(?) road and rail bridge

NHB-23 98 feet; steel, single span

NHB-24 140 feet; steel

NHB-25 187 feet; steel, 4 spans

NHB-26 110 feet; probably steel

NHB-27 431 feet; combination road and rail bridge; steel through truss, 4 spans; 10 feet roadway

NHB-28 564 feet; Bailey bridge

NHB-29 738 feet; combination road and rail bridge; 10 feet roadway

NHB-30 5,614 feet; "DOUMER BRIDGE"; longest in Indochina; combination road and rail bridge; 20 spans (2 end spans through truss at 250 feet with additional pony truss span of 102 feet at one approach; 9 suspension spans at 246 feet alternating with 8 cantilever spans at 348.4 feet); steel through truss supported on piers and abutments of rubble stone masonry below water line and rough ashlar above water line;

NHB-31 2,940 feet; viaduct in Hanoi; 20 feet high over city; masonry arch, 125 spans at 23.5 feet.

NHB-32 5 bridges, none more than 150 feet in length

NHB-33 8 bridges, none more than 150 feet in length

NHB-34 Estimated 197 feet

NHB-35 Estimated 243 feet

NHB-36 Estimated 276 feet

NHB-37 Five bridges, none more than 150 feet in length

NHB-38 Five bridges, none more than 150 feet in length

NHB-39 Fills, with flood spans

NHB-40 Fills, with flood spans

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SELECTED TARGETS - TUNNELS

CHINA

NHT-1 850 feet

NHT-2 600 feet

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GENERAL COMMENTS ON THE KUMMING - HANOI RAILROAD

This is a single-track, <sup>ed</sup> meter-gauge line extending approximately 459 miles from Hanoi to Kuming. The 180-mile section from Hanoi to Lao Kay on the North Vietnam - China border closely follows the valley of the Red River. There are numerous sharp curves down to about 330 feet radius. The gradient, however, along this section is gentle. There are about 140 bridges from Hanoi to Lao Kay, but only 3 exceed 100 feet; no tunnels exist on this section.

At the China border the line enters mountainous country and follows the valley of the Nam-ch'i for approximately 100 miles. In this section the terrain is extremely rugged with many gorges and precipitous slopes (see accompanying photos). The worst section extends from bridge KHB-12 to KHB-13 with numerous bridges and probably a score or more tunnels. In addition to the vulnerability of the bridges and tunnels, this section of the rail line would be highly vulnerable to earth and rock slides.

From Pi-se-chai (about 6 miles north of the important town of Peng-tai shown on sheet NF 48-1) to Kuming, the line alternates between open valleys and plains and rough hills and mountains. There are numerous bridges and a few tunnels, and in the mountainous sections the line would be susceptible to damage from landslides and rock fall.

The targets listed below were selected from detailed railroad studies compiled during World War II supplemented by later data where available. Details of the structure of the bridges are probably accurate for the

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northern section from Kunming to Pi-se-chai; the remaining section of the railroad to Hanoi was largely destroyed during World War II and the Indo-chinese hostilities. Since it is not known whether or not the recent reconstruction of the line has followed exactly the old alignment, the location of targets south of Pi-se-chai should be considered as only approximate. Similarly, information concerning the structural characteristics of the bridges has not been obtainable.

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SELECTED TARGETS - BRIDGES

CHINA

- KHB- 1     5 bridges within 3 mile stretch; 1 to 3 spans; 50 to 100 feet long; masonry arches
- KHB- 2     295 feet long; steel lattice truss span
- KHB- 3     100 feet long; concrete arch, 5 spans
- KHB- 4     265 feet long; steel lattice truss span
- KHB- 5     295 feet long; steel lattice truss span
- KHB- 6     3 bridges, 35 to 65 feet long, in 7 mile long stretch; masonry arches
- KHB- 7     15 bridges, 35 to 50 feet long, in 8 mile long stretch; masonry arches
- KHB- 8     230 feet long
- KHB- 9     295 feet long; steel lattice truss span
- KHB-10     265 feet long; steel lattice truss span
- KHB-11     240 feet long; masonry arches
- KHB-12     110 feet long
- KHB-13     165 feet long
- KHB-14     260 feet long
- KHB-15     130 feet long
- KHB-16     165 feet long
- \*KHB-17     Possibly 12 bridges 30 to 200 feet long, in 10 mile long stretch.
- KHB-18     100 feet long
- KHB-19     130 feet long
- KHB-20     160 feet long
- KHB-21     145 feet long
- \*KHB-17a     442 foot bridge. Probably highest and longest bridge on entire line.  
                  (see photos)



SELECTED TARGETS - BRIDGES

NORTH VIETNAM

- KHB-22 New spans have probably replaced destroyed former steel bridge of 400 feet length over Nam-ch'ang connecting North Vietnam and China.
- KHB-23 Damaged 1951. Original was steel bridge, eighty-five feet long, single track. Probably replaced.
- KHB-24 Destroyed 1951. Original was steel bridge, eighty-one feet long, single track. Probably replaced.
- KHB-25 Damaged 1951. Original was steel bridge, eighty feet long, single track. Probably replaced.
- KHB-26 Destroyed 1951. Original was steel bridge, 130 feet long, single track, 2 spans. Probably replaced.
- KHB-27 Steel bridge, eighty feet long, single track.
- KHB-28 98 feet; steel through truss.
- KHB-29 82 feet; steel
- KHB-30 968 feet; steel, 4 spans; destroyed as of 1952; pontoon road bridge reported alongside.
- KHB-31 95 feet; steel through truss.
- KHB-32 98 feet; steel; destroyed as of 1952.
- KHB-33 295 feet; steel through truss; 2 spans; 1 span destroyed as of 1952.
- KHB-34 98 feet; steel through truss; destroyed as of 1952.
- KHB-35 Original road bridge of 700 feet destroyed. Connection between two parts of Lao Kay now probably limited to foot bridges with capacity for small carts and mules. Trucks probably ferried.
- KHB-36 Area of small bridges less than 150 feet in length.
- KHB-37 Area of small bridges less than 150 feet in length.
- KHB-38 Area of small bridges less than 150 feet in length.
- KHB-39 Area of small bridges less than 150 feet in length.
- KHB-40 5 bridges; none more than 150 feet

NORTH VIETNAM - BRIDGES (Con't)

KHB-41 3 bridges; none more than 150 feet.  
KHB-42 318 feet; steel; principal bridge on route.  
KHB-43 6 bridges; none more than 150 feet.  
KHB-44 3 bridges; none more than 150 feet.  
KHB-45 3 bridges; none more than 150 feet.

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SELECTED TARGETS - TUNNELS

CHINA

KHT-1 No details

KHT-2 No details

KHT-3 There are numerous tunnels, probably in excess of 15, in this particular section. No other details known except for probable location of major tunnels as indicated on map.

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